



with the respective positive controls. This effect is present in both the HEK and human synovial fluid cells.

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STUDIES ON CORRELATION BETWEEN ANGIOGENESIS AND THE SYNOVIAL AQUAPORINS-1 EXPRESSION IN PATIENTS WITH KNEE OSTEOARTHRITIS

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Purpose: To explore the effect of the AQP-1 expression and angiogenesis on the KOA synovitis and to provide the experimental basis for further study of knee osteoarthritis by observing angiogenesis and the synovial aquaporins-1 expression in patients with knee osteoarthritis and analyzing their correlations.

Methods: according to the Kellgren – Lawrence (K/L) classification and the American rheumatism association KOA standards, 50 patients are divided into three groups: early KOA group, late KOA group and normal group. Then macroscopic observation of knee joint sample line and histological observation under a microscope are carried out, and synovial histological changes are evaluated by Krenn synovitis score. The AQP1 and CD34 expression in the synovial tissue are decided through the immunohistochemical detection. New endothelial cells marked by Microscope CD34 monoclonal antibody are counted, and the microvascular density (MVD) is calculated. With Pearson linear correlation analysis, the correlations between MVD, synovitis score, and the expression rate of AQP-1 positive cells are analyzed respectively.

Results: (1) Knee joint synovials in the early KOA group and late KOA group find inflammatory changes. The main changes are synovial lining layer hyperplasia, vascular proliferation and inflammatory cell invasion. The synovial inflammation of KOA group scores markedly higher than that of the normal group, with comparatively sharp difference ($p < 0.05$), and the synovial inflammation of the early KOA group levels higher than other two groups, with rather sharp difference ($p < 0.05$). (2) The immunohistochemical detection results show that compared with the normal synovial tissue, AQP-1 and MVD of the KOA group have a higher expression ($p < 0.05$), and compared with the late KOA group, AQP-1 and MVD of the early KOA group find a higher expression ($p < 0.05$). (3) The MVD value shows markedly positive correlation with the synovial inflammation score ($r = 0.825, P < 0.01$); the AQP-1 positive expression rate indicates significantly positive correlation with the synovial cell inflammatory score ($r = 0.827, P < 0.01$); the AQP-1 positive cell expression rate has obviously positive correlation with the MVD value ($r = 0.894, P < 0.01$).

Conclusions: (1) AQP-1 expression and new angiogenesis of the KOA group increase significantly compared with those of the normal group, and those of the early KOA group grow relatively compared with those of the late KOA group; and the higher AQP-1 expression may be associated with synovial angiogenesis. (2) Through coordinating the higher AQP-1 expression in the KOA synovium and angiogenesis may have the effect on the formation of the patients' KOA synovitis and the occurrence and development of KOA.

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MEDIATION OF INFLAMMATION INDUCED EARLY PROTEASE ACTIVATION IN KNEE JOINT EXPLANTS THROUGH TIMELY INTERVENTION WITH GLUCOCORTICOID

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Purpose: Severe injuries to the knee joint, such as anterior cruciate ligament (ACL) tears and/or meniscal damage, often results in accelerated development of osteoarthritis (OA). It is hypothesized that interplay between altered mechanics and inflammation induced biological changes following knee joint injury, may be causative factors for OA development. Clinical evidence suggests that inflamed synovium and fat pad can add to adjacent articular cartilage damage. Following ACL rupture and/or surgery, the synovium and fat pad exhibit increased mRNA levels for inflammatory and degradative markers. We tested the hypothesis that early inhibition of inflammation was essential for suppressing the resulting upregulation of degradative proteinases. Methylprednisolone acetate (MPA; Depo-Medrol®, Pfizer) is a corticosteroid that is commonly clinically used for mitigating inflammation in many chronic inflammatory diseases. The present study evaluated the efficacy of using MPA for suppression of inflammation and consequently the degradative proteases in the synovium and fat pad tissue. Evaluation of the synovium and fat pad tissue responsiveness could provide relevant prognostic information, which may indicate that early intervention following severe knee injuries is essential to prevent initial cartilage degradation.

Methods: Hind limbs from normal 7-9 month old, female Suffolk Cross sheep were obtained following sacrifice and fat pad (6mm) and synovium tissue explants (6mm) were harvested from the knee joint. The explants were equilibrated in an incubator overnight in serum free Dulbecco's Modified Eagle's Medium (DMEM) at 37°C. The explants